Death Valley Ranch Solar Heater
Death VAlley National Monument
Inyo County
California

HABS No. CA-2257 K

HABS
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14-DVNM,
1-K-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Buildings Survey
National Park Service
Department of the Interior
Washington, D.C. 20013-7127

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HISTORIC AMERICAN BUILDINGS SURVEY

DEATH VALLEY RANCH SOLAR HEATER
(Scotty's Castle, Solar Heater)

HABS No. CA-2257 K

Location: National Park Service Route 5 (commonly known as the North Highway), 25 miles west of the junction of US Route 95 with Nevada State Route 267 (commonly known as Scotty's Junction), Death Valley National Monument, Inyo County, California.

Present Owner: National Park Service.

Present Use: Non-functional.

Significance: The Solar Heater at Death Valley Ranch is a rare surviving example of a solar industry that thrived in Southern California before World War II and before the widespread use of natural gas.[1]

PART I. HISTORICAL INFORMATION

Note: For general information on the Death Valley Ranch complex, see HABS No. CA-2257.

A. Physical History:

1. Date of Erection:

May 1929 - The concrete platform was poured.[2]
June 1929 - Two tanks were erected and the grading for the coils began.[3]
September 1929 - The tanks were insulated.[4]
October 1929 - The Solar Heater was operational.[5]
September 1930 - The foundation and walls for Solar Heater extension were poured.[6]
Winter 1938 - A severe winter occurred that might have made the Solar Heater totally dysfunctional.

2. Designer: Charles Alexander MacNeilledge designed several different versions of a tower to house the Solar Heater's water tank that was never built. The system itself was designed by the manufacturer, Day and Night Solar Water Heater Co., Monrovia, California. Its placement and location were probably designed by Thompson.

3. Original and Subsequent Owners:

Albert Mussey Johnson (1929-1948)
Gospel Foundation (1948-1970)
National Park Service (1970-Present)

4. Builder, Supplier, etc:

General Superintendent - M. Roy Thompson
Building Superintendent - H. B. Brown (1929-1930)
C. G. Johnson (1930-1931)

Manufacturer of Solar Heater - Day and Night Water Heater Co., Monrovia, California.

5. Original plans and construction: There is one allusion in an early letter to placing the hot water tanks in the Chimes Tower. In it, Charles A. MacNeilledge suggested that the tanks of the Solar Heater be housed in a tower separate from the chimes.[7]

Thompson, the General Construction Superintendent, prepared at least two sketches that were probably attempts to locate the Solar Heater at sites other than it is now. The first is entitled "Sketch Showing General Layout of Buildings and Roads" and is dated 2-10-28.[8] It places the Solar Heater to the southwest of the Garage. Only the Solar Heater is penciled in; the rest of the sketched plan is in ink. A second sketch entitled "Cross Section of Tunnel Under Lake To Solar Heater Plant" is prepared on graph paper and dated 5-19-28. It seems to be a working drawing that locates the Solar Heater south of the tunnel that passes under the swimming pool.[9] These two drawings indicate that Thompson played a key role in its structural development and in its eventual siting.

MacNeilledge prepared at least two preliminary studies of a tower to house the tanks. Both are now in the Reference Library of Scotty's Castle.[10] Although each of the designs is different in some minor respects, each has a flattened hip roof covered with tiles, windows at the top center of each elevation and are very similar to each other in most other respects.

When construction of the first four panels of "sun coils" were completed, Thompson wrote "The Tower Building around the tanks has not been started, as per your instructions, as you said you did not want it built until you came out."[11] No working or construction drawings for the Tower or Solar Heater are known to exist.

6. Alterations and additions: None. No tower was ever built.

B. Historical Context:

Construction on the Death Valley Ranch Solar Heater began at the end of May 1929, when a concrete platform was poured.[12] Within two weeks two tanks were set in place on the platform with guy wires.[13] Six inches of hair-felt insulation, in three layers of two inches each, were wrapped around the tanks. Grading for the inclined concrete platform that supports the copper "sun coils" soon followed.[14] By September, building paper, cheesecloth and a coat of waterproof paint provided additional layers of protection for the tanks against the weather.[15] A January 28, 1930, letter from the General Construction Superintendent, Thompson, to Johnson mentions that "Even in this cold season the solar heater is furnishing plenty of warm water, but it is not hot."[16] In September 1930 four additional panels of "sun coils" were constructed, perhaps in an effort to improve the output of hot water. One report mentions that one particular season of freezing weather damaged the Solar Heater severely and left it inoperable although it does not specify.[17] As the winter of 1938-1939 was severe enough to kill the three palm trees that had been planted in the entrance court directly in front of the main house, this might have been the winter the above report refers to.

PART II. ARCHITECTURAL INFORMATION

A. General Statement:

1. Architectural Character: A concrete platform, inclined towards the sun at approximately a 30 degree angle, supports eight "sun coils," the commercial name for the heat-collecting panels. They are made of copper and have been painted black to maximize the amount of solar energy absorbed. Directly behind them are two water tanks; one 20 feet, the other 5 feet tall. It is unknown exactly what function these tanks performed.

2. Condition of Fabric: Poor. The wood surrounding the "sun coils" is decayed. The paint covering the building paper has cracked and peeled. The building paper itself has torn away, leaving the insulation underneath open to the weather. None of the glass covering the solar panels survives.

B. Description of Exterior:

Large Tank - 20 feet tall - 120 gallon capacity.
Smaller Tank - 5 feet tall - (?) gallon capacity.
Concrete platform for "sun coils" - 58' long x 10' wide. Each panel is approximately 12' x 5'.
Concrete pad for tanks - 17' x 17'.

C. Site: The Solar Heater is situated above, behind and north of the Annex to the Main House. It is also just north of a 15-foot bluff and has an excellent southern exposure. It is bordered to its north by a road, now used as a self-guided interpretative trail, that begins at the Entrance Court, passes the Cook House and terminates on the top of "Windy Point," the site where Scotty was buried.

PART III. PROJECT INFORMATION

The Scotty's Castle Recording Project at Death Valley National Monument, California, was undertaken during the summers 1987-89 by the Historic American Buildings Survey (HABS) division of the National Park Service, and co-sponsored by the Western Regional Office of the National Park Service. Principals involved were Robert J. Kapsch, Chief of HABS/HAER; Kenneth L. Anderson, AIA, Chief of HABS and project leader in 1987 and 1988; and Paul D. Dolinsky, Principal Architect of HABS and project leader in 1989.

The recording teams were supervised in the field by Marlys B. Thurber in 1987, John White in 1988, and Joseph D. Balachowski in 1989. The written documentation was prepared by Richard A. Bernstein of Cornell University in 1987.

PART IV. SOURCES OF INFORMATION

The repository of nearly all of the sources of information is the Reference Library and Preservation Office, Scotty's Castle, Death Valley National Monument, California. Individual references take the form of endnotes, as follows:

1. Letter from Michael Luttrell to Jack Fields dated July 21, 1983. Record group 1, box 6.

2. Letter from M. Roy Thompson to Albert M. Johnson dated May 31, 1929. Manuscript 7, box 8.

3. Letters from M. Roy Thompson to Albert M. Johnson dated June 6 and June 11, 1929. Manuscript 7, box 8.

4. Letter from M. Roy Thompson to Albert M. Johnson dated September 25, 1929. Manuscript 7, box 9.

5. Letter from M. Roy Thompson to Albert M. Johnson dated october 17, 1929. Manuscript 7, box 9.

6. Letter from M. Roy Thompson to Albert M. Johnson dated September 17, 1930. Manuscript 7, box 12.

7. "Regarding the Tower for chimes. It may be necessary to design a detached tower to house the water tanks on account of the location of solar heater." Letter from Charles Alexander MacNeilledge to Albert M. Johnson, dated October 27, 1927. Manuscript 5, box 1.

8. Manuscript 7, box 2.

9. Manuscript 12, box 4.

10. Architectural drawings, catalogue nos. 21171, 21172, 21173 and 21174.

11. Letter from M. Roy Thompson to Albert M. Johnson, dated January 28, 1930. Manuscript 7, box 10.

12. Letter from M. Roy Thompson to Albert M. Johnson dated May 31, 1929. Manuscript 7, box 8.

13. Letter from M. Roy Thompson to Albert M. Johnson dated June 6, 1929. Manuscript 7, box 8.

14. Letter from M. Roy Thompson to Albert M. Johnson dated June 11, 1929. Manuscript 7, box 8.

15. Letter from M. Roy Thompson to Albert M. Johnson dated September 25, 1929. Manuscript 7, box 9.

16. Letter from M. Roy Thompson to Albert M. Johnson dated January 28, 1930. Manuscript 7, box 10.

17. Laura Soulliere, National Register Nomination, "Death Valley Scotty Historic District," May 1976.

ADDENDUM TO:
DEATH VALLEY RANCH, SOLAR HEATER
Death Valley National Park
Death Valley Junction vicinity
Inyo County
California

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CAL,14-DVNM,1-K-

REDUCED COPIES OF MEASURED DRAWINGS

FIELD RECORDS

HISTORIC AMERICAN BUILDINGS SURVEY
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001